

Greatest Of All Times

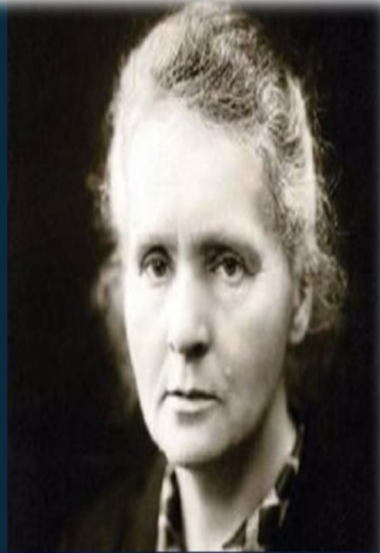
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Globally selected
PERSONALITIES

*"In science, we must be interested
in things, not in persons."*

- Marie Curie



FAMOUSQUOTES123.COM



7 Nov 1867 <::><::><::> 4 Jul 1934

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7 Nov 1867



4 July 1934

Marie Curie

The Nobel Prize in Physics 1903

Prize motivation

"in recognition of the extraordinary services they have rendered
by their joint researches on the radiation phenomena
discovered by Professor Henri Becquerel"

Prize share: $\frac{1}{4}$

<https://www.nobelprize.org/prizes/physics/1903/marie-curie/facts/>

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Marie Curie

The Nobel Prize in Chemistry 1911

Prize motivation

"in recognition of her services to the advancement of chemistry
by the discovery of the elements radium and polonium,
by the isolation of radium and the study of the nature and
compounds of this remarkable element"

Prize share: 1/1

<https://www.nobelprize.org/prizes/chemistry/1911/marie-curie/facts/>

Marie Curie

https://en.wikipedia.org/wiki/Marie_Curie

Maria

Salomea

Skłodowska

Curie (Polish: [\[ˈmarja salɔˈmɛa skwɔˈdɔfska kɨˈri\]](#) ; *née* **Skłodowska**; 7 November 1867 – 4 July 1934), known simply as **Marie Curie** (/ˈkjuəri/ *[KURE-ee](#)*; French: [\[mɑʁi kyʁi\]](#)), was a Polish and [naturalised](#)-French [physicist](#) and [chemist](#) who conducted pioneering research on [radioactivity](#). She was the [first woman to win a Nobel Prize](#), the first person to [win a Nobel Prize twice](#), and the only person to win a Nobel Prize in two scientific fields. Her husband, [Pierre Curie](#), was a co-winner of her first Nobel Prize, making them the [first married couple](#) to win the Nobel Prize and launching the [Curie family legacy](#) of five Nobel Prizes. She was, in 1906, the first woman to become a professor at the [University of Paris](#).

She was born in [Warsaw](#), in what was then the [Kingdom of Poland](#), part of the [Russian Empire](#). She studied at Warsaw's clandestine [Flying University](#) and began her practical scientific training in Warsaw. In 1891, aged 24, she followed her elder sister [Bronisława](#) to study in Paris, where she earned her higher degrees and conducted her subsequent scientific work. In 1895, she married the French physicist [Pierre Curie](#), and she shared the 1903 [Nobel Prize in Physics](#) with him and with the physicist [Henri Becquerel](#) for their pioneering work developing the theory of "radioactivity"—a term she coined. In 1906, Pierre Curie died in a Paris street accident. Marie won the 1911 [Nobel Prize in Chemistry](#) for her discovery of the elements [polonium](#) and [radium](#), using techniques she invented for isolating radioactive [isotopes](#). Under her direction, the world's first studies were conducted into the treatment of [neoplasms](#) by the use of radioactive isotopes. She founded the [Curie Institute in Paris](#) in 1920, and the [Curie Institute in Warsaw](#) in 1932; both remain major medical research centres. During [World War I](#), she developed mobile radiography units to provide [X-ray](#) services to [field hospitals](#).

While a French citizen, Marie Skłodowska Curie, who used both surnames, never lost her sense of Polish identity. She taught her daughters the Polish language and took them on visits to Poland. She named the first [chemical element](#) she discovered [polonium](#), after her native country. Marie Curie died in 1934, aged 66, at the [Sancellemoz sanatorium](#) in [Passy \(Haute-Savoie\)](#), France, of [aplastic anaemia](#) likely from exposure to radiation in the course of her scientific research and in the course of her radiological work at field hospitals during [World War I](#). In addition to her Nobel Prizes, she received numerous other honours and tributes; in 1995 she became the first woman to be entombed on her own merits in the Paris [Panthéon](#), and Poland declared 2011 the Year of Marie Curie during the [International Year of Chemistry](#). She is the subject of numerous biographical works.

Marie Curie



Curie, c. 1920

Born	Maria Salomea Skłodowska 7 November 1867 Warsaw , Congress Poland , Russian Empire (now Poland)
Died	4 July 1934 (aged 66) Passy, Haute-Savoie , French Third Republic (now France)
Cause of death	Aplastic anaemia
Citizenship	France (1895–1934)
Alma mater	University of Paris
Known for	Pioneering research on radioactivity Discoveries of polonium and radium
Spouse	Pierre Curie (m. 1895; died 1906)
Children	<ul style="list-style-type: none">• Irène• Ève
Parents	<ul style="list-style-type: none">• Władysław Skłodowski• Bronisława Boguska
Relatives	<ul style="list-style-type: none">• Józef Skłodowski (grandfather)• Bronisława Skłodowska (sister)• Helena Skłodowska (sister)• Józef Boguski (cousin)
Family	Skłodowski (by birth) Curie (by marriage)
Awards	<ul style="list-style-type: none">• Davy Medal (1903)• Nobel Prize in Physics (1903)• Matteucci Medal (1904)• Actonian Prize (1907)• Elliott Cresson Medal (1909)• Albert Medal (1910)• Nobel Prize in Chemistry (1911)

- [Willard Gibbs Award](#) (1921)
- [John Scott Medal](#) (1921)
- [Cameron Prize for Therapeutics of the University of Edinburgh](#) (1931)

Scientific career

Fields [Physics](#)
[Chemistry](#)

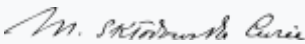
- Institutions**
- University of Paris
 - [Institut du Radium](#)
 - [École Normale Supérieure](#)
 - [French Academy of Medicine](#)
 - [International Committee on Intellectual Cooperation](#)

[Thesis](#) [Recherches sur les substances radioactives \(Research on Radioactive Substances\)](#) (1903)

[Doctoral advisor](#) [Gabriel Lippmann](#)

- Doctoral students**
- [André-Louis Debierne](#)
 - [Gioacchino Failla](#)
 - [Ladislav Goldstein](#)
 - [Émile Henriot](#)
 - [Irène Joliot-Curie](#)
 - [Óscar Moreno](#)
 - [Marguerite Perey](#)
 - [Francis Perrin](#)

Signature




Władysław Skłodowski and daughters (from left) Maria, [Bronisława](#), and [Helena](#), 1890



Maria (left) and sister [Bronisława](#), c. 1886



**Marie Curie's birthplace, 16 Freta Street,
Warsaw, Poland**



***Krakowskie Przedmieście 66, Warsaw, where
Maria did her first scientific work, 1890-91***



Pierre Curie and Marie Skłodowska-Curie, 1895



Pierre and Marie Curie in the laboratory, c. 1904



1903 Nobel Prize diploma



1911 Nobel Prize diploma



Curie in a mobile X-ray vehicle, c. 1915



At the first Solvay Conference (1911), Curie (seated, second from right) confers with Henri Poincaré; standing nearby are Rutherford (fourth from right), Einstein (second from right), and Paul Langevin (far right).



Pierre, Irène, and Marie Curie, ca. 1902



Marie and daughter Irène, 1925

Her Death

Curie visited Poland for the last time in early 1934. A few months later, on 4 July 1934, she died aged 66 at the Sancellemoz sanatorium in Passy, Haute-Savoie, from aplastic anaemia believed to have been contracted from her long-term exposure to radiation, causing damage to her bone marrow.

The damaging effects of ionising radiation were not known at the time of her work, which had been carried out without the safety measures later developed. She had carried test tubes containing radioactive isotopes in her pocket, and she stored them in her desk drawer, remarking on the faint light that the substances gave off in the dark. Curie was also exposed to X-rays from unshielded equipment while serving as a radiologist in field hospitals during the First World War. When Curie's body was exhumed in 1995, the French *Office de*

Protection contre les Rayonnements Ionisants (OPRI) "concluded that she could not have been exposed to lethal levels of radium while she was alive". They pointed out that radium poses a risk only if it is ingested, and speculated that her illness was more likely to have been due to her use of radiography during the First World War.

She was interred at the cemetery in [Sceaux](#), alongside her husband Pierre. Sixty years later, in 1995, in honour of their achievements, the remains of both were transferred to the Paris [Panthéon](#). Their remains were sealed in a lead lining because of the radioactivity. She became the second woman to be interred at the Panthéon (after [Sophie Berthelot](#)) and the first woman to be honoured with interment in the Panthéon on her own merits.



1935 statue, facing the Radium Institute, [Warsaw](#)



[Marie Curie Monument in Lublin](#)

Because of their levels of radioactive contamination, her papers from the 1890s are considered too dangerous to handle. Even her cookbooks are highly radioactive. Her papers are kept in lead-lined boxes, and those who wish to consult them must wear protective clothing. In her last year, she worked on a book, *Radioactivity*, which was published posthumously in 1935.



Commemoration & Memorials

As one of the most famous scientists in history, Marie Curie has become an icon in the scientific world and has received tributes from across the globe, even in the realm of [pop culture](#). She also received many honorary degrees from universities across the world.

Marie Curie was the first woman to win a Nobel Prize, the first person to win two Nobel Prizes, the only woman to win in two fields, and the only person to win in [multiple sciences](#). Awards and honours that she received include:

- [Nobel Prize in Physics](#) (1903, with her husband Pierre Curie and Henri Becquerel)
- [Davy Medal](#) (1903, with Pierre)
- [Matteucci Medal](#) (1904, with Pierre)
- [Actonian Prize](#) (1907)
- [Elliott Cresson Medal](#) (1909)
- [Legion of Honour](#) (1909, rejected)
- [Nobel Prize in Chemistry](#) (1911)
- [Civil Order of Alfonso XII](#) (1919)
- [Franklin Medal](#) of the [American Philosophical Society](#) (1921)^[94]
- [Order of the White Eagle](#) (2018, posthumously)

Entities that have been named after Marie Curie include:

- The [curie](#) (symbol Ci), a unit of radioactivity, is named in honour of her and Pierre Curie (although the commission which agreed on the name never clearly stated whether the standard was named after Pierre, Marie, or both).
- The element with atomic number 96 was named [curium](#) (symbol Cm).
- Three radioactive minerals are also named after the Curies: [curite](#), [sklodowskite](#), and [cuprosklodowskite](#).
- The [Marie Skłodowska-Curie Actions](#) fellowship program of the [European Union](#) for young scientists wishing to work in a foreign country
- In 2007, [a metro station in Paris](#) was renamed after both of the Curies.
- The Polish research [nuclear reactor Maria](#)
- The [7000 Curie](#) asteroid
- [Marie Curie charity](#), in the United Kingdom

- The [IEEE Marie Skłodowska-Curie Award](#), an international award presented for outstanding contributions to the field of nuclear and plasma sciences and engineering, was established by the [Institute of Electrical and Electronics Engineers](#) in 2008.
- The [Marie Curie Medal](#), an annual [science award](#) established in 1996 and conferred by the [Polish Chemical Society](#)
- The Marie Curie-Skłodowska Medal and Prize, an annual award conferred by the London-based [Institute of Physics](#) for distinguished contributions to physics education
- [Maria Curie-Skłodowska University](#) in [Lublin](#), Poland
- [Pierre and Marie Curie University](#) in Paris
- [Maria Skłodowska-Curie National Research Institute of Oncology](#) in Poland
- [École élémentaire Marie-Curie](#) in London, Ontario, Canada; [Curie Metropolitan High School](#) in Chicago, United States; [Marie Curie High School](#) in Ho Chi Minh City, Vietnam; [Lycée français Marie Curie de Zurich](#), Switzerland; see [Lycée Marie Curie](#) for a list of other schools named after her
- [Rue Madame Curie](#) in Beirut, Lebanon.

Numerous biographies are devoted to her, including:

- [Ève Curie](#) (Marie Curie's daughter), *Madame Curie*, 1938.
- [Françoise Giroud](#), *Marie Curie: A Life*, 1987.
- [Susan Quinn](#), *Marie Curie: A Life*, 1996.
- [Barbara Goldsmith](#), *Obsessive Genius: The Inner World of Marie Curie*, 2005.
- [Lauren Redniss](#), *Radioactive: Marie and Pierre Curie, a Tale of Love and Fallout*, 2011, adapted into the 2019 British film.
- [Sobel, Dava](#) (24 October 2024). [The Elements of Marie Curie: How the Glow of Radium Lit a Path for Women in Science](#). Fourth Estate. [ISBN 978-0-00-853691-6](#).

Marie Curie has been the subject of a number of films:

- 1943: [Madame Curie](#), a U.S. Oscar-nominated film by [Mervyn LeRoy](#) starring [Greer Garson](#).
- 1997: [Les Palmes de M. Schutz](#), a French film adapted from a play of the same title, and directed by [Claude Pinoteau](#). Marie Curie is played by [Isabelle Huppert](#).

- 2014: [Marie Curie, une femme sur le front](#), a French-Belgian film, directed by [Alain Brunard](#) [fr] and starring [Dominique Reymond](#).
- 2016: [Marie Curie: The Courage of Knowledge](#), a European co-production by [Marie Noëlle](#) starring [Karolina Gruszka](#).
- 2016: [Super Science Friends](#), an American Internet animated series created by Brett Jubinville with Hedy Gregor as Marie Curie.
- 2019: [Radioactive](#), a British film by [Marjane Satrapi](#) starring [Rosamund Pike](#).

Curie is the subject of the 2013 play *False Assumptions* by [Lawrence Aronovitch](#), in which the ghosts of three other women scientists observe events in her life. Curie has also been portrayed by Susan Marie Frontczak in her play, *Manya: The Living History of Marie Curie*, a one-woman show which by 2014 had been performed in 30 U.S. states and nine countries. Lauren Gunderson's 2019 play *The Half-Life of Marie Curie* portrays Curie during the summer after her 1911 Nobel Prize victory, when she was grappling with depression and facing public scorn over the revelation of her affair with Paul Langevin.

The life of the scientist was also the subject of a 2018 Korean musical, titled [Marie Curie](#). The show was since translated in English (as *Marie Curie a New Musical*) and has been performed several times across Asia and Europe, receiving its official [Off West End](#) premiere in [London's](#) [Charing Cross Theatre](#) in summer 2024.

Curie has appeared on more than 600 postage stamps in many countries across the world.

Between 1989 and 1996, she was depicted on a 20,000-[zloty](#) banknote designed by [Andrzej Heidrich](#). In 2011, a commemorative 20-zloty banknote depicting Curie was issued by the [National Bank of Poland](#) on the 100th anniversary of the scientist receiving the Nobel Prize in Chemistry.

In 1994, the [Bank of France](#) issued a 500-[franc](#) banknote depicting Marie and Pierre Curie. As of the middle of 2024, Curie is depicted on French [50 euro cent coins](#) to commemorate her importance in French history.



Timeline

Women in Science

https://en.wikipedia.org/wiki/Timeline_of_women_in_science

This is a **timeline of women in science**, spanning from ancient history up to the 21st century. While the timeline primarily focuses on women involved with [natural sciences](#) such as astronomy, biology, chemistry and physics, it also includes women from the [social sciences](#) (e.g. sociology, psychology) and the [formal sciences](#) (e.g. mathematics, computer science), as well as notable [science educators](#) and [medical scientists](#). The chronological events listed in the timeline relate to both scientific achievements and gender equality within the sciences.

Ancient history

The Tapputi Belatekallim tablet

- 1900 BCE: Aganice, also known as Athyrta, was an Egyptian princess during the Middle Kingdom (about 2000–1700 BCE) working on astronomy and natural philosophy.
- c. 1500 BCE: [Hatshepsut](#), also known as the Queen Doctor, promoted a botanical expedition searching for [official plants](#).
- 1200 BCE: The Mesopotamian perfume-maker [Tapputi-Belatekallim](#) was referenced in the text of a [cuneiform](#) tablet. She is often considered the world's first recorded chemist.
- 500 BCE: [Theano](#) was a Pythagorean philosopher.
- c. 150 BCE: [Aglaonice](#) became the first female astronomer to be recorded in Ancient Greece.
- 1st century BCE: A woman known only as [Fang](#) became the earliest recorded Chinese female [alchemist](#). She is credited with "the discovery of how to turn mercury into silver" – possibly the chemical process of boiling off mercury in order to extract pure silver residue from ores.
- 1st century CE: [Mary the Jewess](#) was among the world's first alchemists.
- c. 300–350 CE: Greek mathematician [Pandrosion](#) develops a numerical approximation for cube roots.
- c. 355–415 CE: Greek astronomer, mathematician and philosopher [Hypatia](#) became renowned as a respected academic teacher, commentator on mathematics, and head of her own science academy.
- 3rd century CE: [Cleopatra the Alchemist](#), an early figure in chemistry and practical alchemy, is credited as inventing the [alembic](#).

Middle Ages

- c. 975 CE: Chinese alchemist [Keng Hsien-Seng](#) was employed by the Royal Court. She distilled perfumes, utilized an early form of the [Soxhlet process](#) to extract camphor into alcohol, and gained recognition for her skill in using mercury to extract silver from ores.
- 10th century: [Al-'Ijliyyah](#) manufactured [astrolabes](#) for the court of [Sayf al-Dawla](#) in [Aleppo](#).
- Early 12th century: [Dobrodeia of Kiev](#) (died 1131), a [Rus'](#) princess and Empress of the [Eastern Roman Empire](#), was the first woman to write a treatise on medicine.
- Early 12th century: The Italian medical practitioner [Trota of Salerno](#) compiled medical works on women's ailments and skin diseases.

- 12th century: Adelle of the Saracens taught at the [Salerno School of Medicine](#).
- 12th century: [Hildegard of Bingen](#) (1098–1179) was a founder of scientific natural history in Germany.
- 1159: The Alsatian nun [Herrad of Landsberg](#) (1130–1195) compiled the scientific compendium *Hortus deliciarum*.
- Early 14th century: [Adelmota of Carrara](#) was a physician in [Padua](#), Italy.

16th century

- 1561: Italian alchemist [Isabella Cortese](#) published her popular book *The Secrets of Lady Isabella Cortese*. The work included recipes for medicines, distilled oils and cosmetics, and was the only book published by a female alchemist in the 16th century.
- 1572: Italian botanist [Loredana Marcello](#) died from the [plague](#) – but not before developing several effective [palliative](#) formulas for plague sufferers, which were used by many physicians.
- 1572: Danish scientist [Sophia Brahe](#) (1556–1643) assisted her brother [Tycho Brahe](#) with his astronomical observations.
- 1590: After her husband's death, [Caterina Vitale](#) took over his position as chief pharmacist to the [Order of St John](#), becoming the first female chemist and pharmacist in [Malta](#).

17th century

- 1609: French midwife [Louise Bourgeois Boursier](#) became the first woman to write a book on childbirth practices.
- 1636: [Anna Maria van Schurman](#) is the first woman ever to attend university lectures. She had to sit behind a screen so that her male fellow students would not see her.
- 1642: [Martine Bertereau](#), the first recorded female [mineralogist](#), was imprisoned in France on suspicion of witchcraft. Bertereau had published two written works on the science of mining and [metallurgy](#) before being arrested.
- 1650: [Silesian](#) astronomer [Maria Cunitz](#) published *Urania Propitia*, a work that both simplified and substantially improved [Johannes Kepler](#)'s mathematical methods for locating planets. The book was published in both Latin *and* German, an unconventional decision that made the scientific text more accessible for non-university educated readers.
- 1656: French chemist and alchemist [Marie Meurdrac](#) published her book *La Chymie Charitable et Facile, en Faveur des Dames* (Useful and Easy Chemistry, for the Benefit of Ladies).
- 1667: [Margaret Lucas Cavendish](#), Duchess of Newcastle upon Tyne (1623 – 15 December 1673) was an English aristocrat, philosopher, poet, scientist, fiction-writer, and playwright during the 17th century. She was the first woman to attend a meeting at the [Royal Society of London](#), in 1667, and she criticised and engaged with members and philosophers [Thomas Hobbes](#), [René Descartes](#), and [Robert Boyle](#).
- 1668: After separating from her husband, French polymath [Marguerite de la Sablière](#) established a popular [salon](#) in Paris. Scientists and scholars from different countries visited the salon regularly to discuss ideas and share knowledge, and Sablière studied physics, astronomy and natural history with her guests.
- 1680: French astronomer [Jeanne Dumée](#) published a summary of arguments supporting the [Copernican theory of heliocentrism](#). She wrote "between the brain of a woman and that of a man there is no difference".
- 1685: Frisian poet and archaeologist [Titia Brongersma](#) supervised the first excavation of a [dolmen](#) in [Borger, Netherlands](#). The excavation produced new evidence that the stone structures were graves constructed by prehistoric humans – rather than structures built by [giants](#), which had been the prior common belief.

- 1690: German-Polish astronomer [Elisabetha Koopman Hevelius](#), widow of [Johannes Hevelius](#), whom she had assisted with his observations (and, probably, computations) for over twenty years, published in his name *Prodromus Astronomiae*, the largest and most accurate star catalog to that date.
- 1693–1698: German astronomer and illustrator [Maria Clara Eimmart](#) created more than 350 detailed drawings of the moon phases.
- 1699: German entomologist [Maria Sibylla Merian](#), the first scientist to document the life cycle of insects for the public, embarked on a scientific expedition to [Suriname](#), South America. She subsequently published *Metamorphosis insectorum Surinamensium*, a groundbreaking illustrated work on South American plants, animals and insects.

18th century

- 1702: Pioneering English entomologist [Eleanor Glanville](#) captured a butterfly specimen in [Lincolnshire](#), which was subsequently named the [Glanville fritillary](#) in her honour. Her extensive butterfly collection impressed fellow entomologist William Vernon, who called Glanville's work "the noblest collection of butterflies, all English, which has sham'd us". Her butterfly specimens became part of early collections in the [Natural History Museum](#).
- 1702: German astronomer [Maria Kirch](#) became the first woman to discover a comet. ^[38]
- c. 1702–1744: In [Montreal, Canada](#), French botanist [Catherine Jérémie](#) collected plant specimens and studied their properties, sending the specimens and her detailed notes back to scientists in France.
- 1732: At the age of 20, Italian physicist [Laura Bassi](#) became the first female member of the [Bologna Academy of Sciences](#). One month later, she publicly defended her academic theses and received a PhD. Bassi was awarded an honorary position as professor of physics at the [University of Bologna](#). She was the first female physics professor in the world.
- 1738: French polymath [Émilie du Châtelet](#) became the first woman to have a paper published by the [Paris Academy](#), following a contest on the nature of fire.
- 1740: French polymath [Émilie du Châtelet](#) published *Institutions de Physique* (*Foundations of Physics*) providing a metaphysical basis for [Newtonian physics](#).
- 1748: Swedish [agronomist](#) [Eva Ekeblad](#) became the first female member of the [Royal Swedish Academy of Sciences](#). Two years earlier, she had developed a new process of using potatoes to make flour and alcohol, which subsequently lessened Sweden's reliance on wheat crops and decreased the risk of famine.
- 1751: 19-year-old Italian physicist [Cristina Roccati](#) received her PhD from the University of Bologna.
- 1753: [Jane Colden](#), an American, was the only female biologist mentioned by [Carl Linnaeus](#) in his masterwork *Species Plantarum*.
- 1754: [Dorothea Erxleben](#) was the first female to be awarded a doctor in medicine in Germany (University of Halle, then Kingdom of Prussia). She practiced medicine from 1747 to 1762 in [Quedlinburg](#).
- 1755: After the death of her husband, Italian anatomist [Anna Morandi Manzolini](#) took his place at the [University of Bologna](#), becoming a professor of [anatomy](#) and establishing an internationally known laboratory for anatomical research.
- 1757: French astronomer [Nicole-Reine Lepaute](#) worked with mathematicians [Alexis Clairaut](#) and [Joseph Lalande](#) to calculate the next arrival of [Halley's Comet](#).
- 1760: American horticulturalist [Martha Daniell Logan](#) began corresponding with botanic specialist and collector [John Bartram](#), regularly exchanging seeds, plants and botanical knowledge with him.
- 1762: French astronomer [Nicole-Reine Lepaute](#) calculated the time and percentage of a solar eclipse that had been predicted to occur in two years' time. She created a map to

show the phases, and published a table of her calculations in the 1763 edition of [*Connaissance des Temps*](#).

- 1766: French chemist [Geneviève Thiroux d'Arconville](#) published her study on [putrefaction](#). The book presented her observations from more than 300 experiments over the span of five years, during which she attempted to discover factors necessary for the preservation of beef, eggs, and other foods. Her work was recommended for [royal privilege](#) by fellow chemist [Pierre-Joseph Macquer](#).
- c. 1775: Herbalist/botanist [Jeanne Baret](#) becomes the first woman to circumnavigate the globe.
- c. 1775: French chemist, scientific artist and translator, [Marie-Anne Paulze Lavoisier](#) began working with her husband chemist [Antoine Lavoisier](#). She was instrumental in the 1789 publication of her husband's groundbreaking *Elementary Treatise on Chemistry*, which presented a unified view of chemistry as a field, as she drew diagrams of all the equipment used, and kept strict records that lent validity to the findings. She also translated and critiqued Richard Kirwan's 'Essay on Phlogiston and the Constitution of Acids' which led to the discovery of oxygen gas.
- 1776: At the [University of Bologna](#), Italian physicist [Laura Bassi](#) became the first woman appointed as chair of physics at a university.
- 1776: [Christine Kirch](#) received a respectable salary of 400 Thaler for calendar-making. See also her sister [Margaretha Kirch](#)
- 1782–1791: French chemist and mineralogist [Claudine Picardet](#) translated more than 800 pages of Swedish, German, English and Italian scientific papers into French, enabling French scientists to better discuss and utilize international research in chemistry, mineralogy and astronomy.
- c. 1787–1797: Self-taught Chinese astronomer [Wang Zhenyi](#) published at least twelve books and multiple articles on astronomy and mathematics. Using a lamp, a mirror and a table, she once created a famous scientific exhibit designed to accurately simulate a lunar eclipse.
- 1786–1797: German astronomer [Caroline Herschel](#) discovered eight new comets, along with numerous other discoveries.
- 1789: French astronomer [Louise du Pierry](#), the first Parisian woman to become an astronomy professor, taught the first astronomy courses specifically open to female students.
- 1794: British chemist [Elizabeth Fulhame](#) invented the concept of [catalysis](#) and published a book on her findings.
- c. 1796–1820: During the reign of the [Jiaqing Emperor](#), astronomer [Huang Lü](#) became the first Chinese woman to work with optics and photographic images. She developed a telescope that could take simple photographic images using photosensitive paper.
- 1797: English science writer and schoolmistress [Margaret Bryan](#) published *A Compendious System of Astronomy*, including an engraving of herself and her two daughters. She dedicated the book to her students.

Early 19th century

- 1808: [Anna Sundström](#) began assisting [Jacob Berzelius](#) in his laboratory, becoming one of the first Swedish women chemists.
- 1809: [Sabina Baldoncelli](#) earned her university degree in pharmacy but was allowed to work only in the Italian orphanage where she resided.
- 1815: English archaeologist [Lady Hester Stanhope](#) used a medieval Italian manuscript to locate a promising archaeological site in [Ashkelon](#), becoming the first archaeologist to begin an excavation in the [Palestinian region](#). It was one of the earliest examples of the use of textual sources in field archaeology.

- 1816: French mathematician and physicist [Sophie Germain](#) became the first woman to win a prize from the [Paris Academy of Sciences](#) for her work on [elasticity theory](#).
- 1823: English palaeontologist and fossil collector [Mary Anning](#) discovered the first complete [Plesiosaurus](#).
- 1831: Italian botanist [Elisabetta Fiorini Mazzanti](#) published her best-known work *Specimen Bryologiae Romanae*.
- 1830–1837: Belgian botanist [Marie-Anne Libert](#) published her four-volume *Plantae cryptogamicae des Ardennes*, a collection of 400 species of mosses, ferns, lichen, algae and fungi from the [Ardennes](#) region. Her contributions to systemic [cryptogamic](#) studies were formally recognized by Prussian king [Friedrich Wilhelm III](#), and Libert received a gold medal of merit.
- 1832: French marine biologist [Jeanne Villepreux-Power](#) invented the first glass [aquarium](#), using it to assist in her scientific observations of [Argonauta argo](#).
- 1833: English [phycologists](#) [Amelia Griffiths](#) and [Mary Wyatt](#) published two books on local British seaweeds. Griffiths had an internationally respected reputation as a skilled seaweed collector and scholar, and Swedish botanist [Carl Agardh](#) had earlier named the seaweed genus [Griffithsia](#) in her honour.
- 1833 [Orra White Hitchcock](#) (March 8, 1796 – May 26, 1863) was one of America's earliest women botanical and scientific illustrators and artists, best known for illustrating the scientific works of her husband, geologist [Edward Hitchcock](#) (1793–1864), but also notable for her own artistic and scientific work. The most well known appear in her husband's seminal works, the 1833 *Report on the Geology, Mineralogy, Botany, and Zoology of Massachusetts* and its successor, the 1841 *Final Report* produced when he was State Geologist. For the 1833 edition, [Pendleton's Lithography](#) (Boston) [lithographed](#) nine of Hitchcock's [Connecticut River](#) Valley drawings and printed them as plates for the work. In 1841, [B. W. Thayer and Co.](#), Lithographers (Boston) printed revised lithographs and an additional plate. The hand-colored plate "Autumnal Scenery. View in Amherst" is Hitchcock's most frequently seen work.
- 1835: Scottish polymath [Mary Somerville](#) and German astronomer [Caroline Herschel](#) were elected the first female members of the [Royal Astronomical Society](#).
- 1836: Early English geologist and [paleontologist](#) [Etheldred Benett](#), known for her extensive collection of several thousand fossils, was appointed a member of the Imperial Natural History Society of Moscow. The society – which only admitted men at the time – initially mistook Benett for a man due to her reputation as a scientist and her unusual first name, addressing her diploma of admission to "Dominum" (Master) Benett.^{[69][70]}
- 1840: Scottish fossil collector and illustrator [Lady Eliza Maria Gordon-Cumming](#) invited geologists [Louis Agassiz](#), [William Buckland](#) and [Roderick Murchison](#) to examine her collection of fish fossils. Agassiz confirmed several of Gordon-Cumming's discoveries as new species.
- 1843: During a nine-month period in 1842–43, English mathematician [Ada Lovelace](#) translated [Luigi Menabrea](#)'s article on [Charles Babbage](#)'s newest proposed machine, the Analytical Engine. With the article, she appended a set of notes.^[72] Her notes were labelled alphabetically from A to G. In note G, she describes an algorithm for the Analytical Engine to compute Bernoulli numbers. It is considered the first published algorithm ever specifically tailored for implementation on a computer, and Ada Lovelace has often been cited as the first computer programmer for this reason.^{[73][74]} The engine was never completed, so her program was never tested.
- 1843: British botanist and pioneering photographer [Anna Atkins](#) self-published her book *Photographs of British Algae*, illustrating the work with [cyanotypes](#). Her book was the first book on any subject to be illustrated by photographs.
- 1846: British zoologist [Anna Thynne](#) built the first stable, self-sustaining [marine aquarium](#).

- 1848: American astronomer [Maria Mitchell](#) became the first woman elected to the [American Academy of Arts and Sciences](#); she had discovered a new comet the year before.
- 1848–1849: English scientist [Mary Anne Whitby](#), a pioneer in western [silkworm cultivation](#), collaborated with Charles Darwin in researching the hereditary qualities of silkworms.
- 1850: The [American Association for the Advancement of Sciences](#) accepted its first women members: astronomer [Maria Mitchell](#), entomologist [Margaretta Morris](#), and science educator [Almira Hart Lincoln Phelps](#).

Late 19th century

- 1854: [Mary Horner Lyell](#) was a [conchologist](#) and [geologist](#). She is most well known for her scientific work in 1854, where she studied her collection of land snails from the [Canary Islands](#). She was married to the notable British geologist [Charles Lyell](#) and assisted him in his scientific work. It is believed by historians that she likely made major contributions to her husband's work.
- 1854–1855: [Florence Nightingale](#) organized care for wounded soldiers during the [Crimean War](#). She was an English social reformer and statistician, and the founder of modern nursing. Her pie charts clearly showed that most deaths resulted from disease rather than battle wounds or "other causes," which led the general public to demand improved sanitation at field hospitals.
- 1855: Working with her father, Welsh astronomer and photographer [Thereza Dillwyn Llewelyn](#) produced some of the earliest photographs of the moon.
- 1856: American atmospheric scientist [Eunice Newton Foote](#) presented her paper "Circumstances affecting the heat of the sun's rays" at an annual meeting of the [American Association for the Advancement of Sciences](#). She was an early researcher of the [greenhouse effect](#).^[85]
- 1862: Belgian botanist [Marie-Anne Libert](#) became the first woman to join the Royal Botanical Society of Belgium. She was named an honorary member.
- 1863: German naturalist [Amalie Dietrich](#) arrived in Australia to collect plant, animal and anthropological specimens for the German [Godeffroy Museum](#). She remained in Australia for the next decade, discovering a number of new plant and animal species in the process, but also became notorious in later years for her removal of [Aboriginal](#) skeletons – and the possible incitement of violence against Aboriginal people – for anthropological research purposes.
- 1865: English geologist [Elizabeth Carne](#) was elected the first female Fellow of the [Royal Geological Society of Cornwall](#).

1870s

- 1869/1870: American beekeeper [Ellen Smith Tupper](#) became the first female editor of an entomological journal.
- 1870: [Katharine Murray Lyell](#) was a British botanist, author of an early book on the worldwide distribution of ferns, and editor of volumes of the correspondence of several of the era's notable scientists.
- 1870: [Ellen Swallow Richards](#) became the first American woman to earn a degree in chemistry.
- 1870: Russian chemist [Anna Volkova](#) became the first female member of the [Russian Chemical Society](#).
- 1874: [Julia Lermontova](#) became the first Russian woman to receive a PhD in chemistry.

- 1875: Hungarian archaeologist [Zsófia Torma](#) excavated the site of Turdaş-Luncă in [Hunedoara County](#), today in [Romania](#). The site, which uncovered valuable prehistoric artifacts, became one of the most important archaeological discoveries in Europe.^[93]
- 1876–1878: American naturalist [Mary Treat](#) studied [insectivorous plants](#) in Florida. Her contributions to the scientific understanding of how these plants caught and digested prey were acknowledged by [Charles Darwin](#) and [Asa Gray](#).
- 1878: English entomologist [Eleanor Anne Ormerod](#) became the first female Fellow of the [Royal Meteorological Society](#). A few years afterwards, she was appointed as Consulting Entomologist to the [Royal Agricultural Society](#).

1880s

- 1880: Self-taught German chemist [Agnes Pockels](#) began investigating [surface tension](#), becoming a pioneering figure in the field of [surface science](#). The measurement equipment she developed provided the basic foundation for modern quantitative analyses of surface films.
- 1883: American ethnologist [Erminnie A. Smith](#), the first female field [ethnographer](#), published her collection of [Iroquois](#) legends *Myths of the Iroquois*.
- 1884: English zoologist [Alice Johnson](#)'s paper on newt embryos became the first paper authored by a woman to appear in the *Proceedings of the Royal Society*.
- 1885: British naturalist [Marian Farquharson](#) became the first female Fellow of the [Royal Microscopical Society](#).
- 1886: Botanist [Emily Lovira Gregory](#) became the first female member of the [American Society of Naturalists](#).
- 1887: [Rachel Lloyd](#) became the first American woman to receive a PhD in chemistry, completing her research at the Swiss [University of Zurich](#).
- 1888: Russian scientist [Sofia Kovalevskaya](#) discovered the [Kovalevskaya top](#), one of a brief list of known [rigid body motion](#) examples that are tractable by manipulating equations by hand.
- 1888: American chemist [Josephine Silone Yates](#) was appointed head of the Department of Natural Sciences at Lincoln Institute (later [Lincoln University](#)), becoming the first black woman to head a college science department.
- 1889: Geologist [Mary Emilie Holmes](#) became the first female Fellow of the [Geological Society of America](#).

1890s

- 1890: Austrian-born chemist [Ida Freund](#) became the first woman to work as a university chemistry lecturer in the United Kingdom. She was promoted to full lecturer at [Newnham College, Cambridge](#).
- 1890: Popular science educator and author [Agnes Giberne](#) co-founded the [British Astronomical Association](#).^[109] Subsequently, English astronomer [Elizabeth Brown](#) was appointed the Director of the association's Solar Section, well known for her studies in [sunspots](#) and other solar phenomena.
- 1890: Mathematician [Philippa Fawcett](#) became the first woman to obtain the highest score in the [Cambridge Mathematical Tripos](#) examinations, a score "above the [Senior Wrangler](#)". (At the time, women were ineligible to be named Senior Wrangler.)
- 1891: American-born astronomer [Dorothea Klumpke](#) was appointed as Head of the Bureau of Measurements at the [Paris Observatory](#). For the next decade, in addition to completing her [doctorate of science](#), she worked on the [Carte du Ciel](#) mapping project. She was recognized for her work with the first Prix de Dames award from the [Société astronomique de France](#) and named an Officier of the [Paris Academy of Sciences](#).

- 1892: American psychologist [Christine Ladd-Franklin](#) presented her evolutionary theory on the development of [colour vision](#) to the International Congress of Psychology. Her theory was the first to emphasize colour vision as an evolutionary trait. ^[citation needed]
- 1893: [Florence Bascom](#) became the second woman to earn her PhD in geology in the United States, and the first woman to receive a PhD from [Johns Hopkins University](#).^{[113][114]} Geologists consider her to be the "first woman geologist in this country (America)".
- 1893: American botanist [Elizabeth Gertrude Britton](#) became a charter member of the [Botanical Society of America](#).
- 1894: American astronomer [Margaretta Palmer](#) becomes the first woman to earn a doctorate in astronomy.
- 1895: English physiologist [Marion Bidder](#) became the first woman to speak and present her own paper at a meeting of the [Royal Society](#).
- 1896: Florence Bascom became the first woman to work for the [United States Geological Survey](#).
- 1896: English mycologist and [lichenologist](#) [Annie Lorrain Smith](#) became a founding member of the [British Mycological Society](#). She later served as president twice.
- 1897: American cytologists and zoologists [Katharine Foot](#) and [Ella Church Strobell](#) started working as research partners. Together, they pioneered the practice of photographing microscopic research samples and invented a new technique for creating thin material samples in colder temperatures.
- 1897: American physicist [Isabelle Stone](#) became the first woman to receive a PhD in physics in the United States. She wrote her dissertation "On the Electrical Resistance of Thin Films" at the [University of Chicago](#).
- 1898: Danish physicist [Kirstine Meyer](#) was awarded the gold medal of the [Royal Danish Academy of Sciences and Letters](#).
- 1898: Italian [malacologist](#) [Marianna Paulucci](#) donated her collection of specimens to the Royal Museum of Natural History in Florence, Italy ([Museo di Storia Naturale di Firenze](#)). Paulucci was the first scientist to compile and publish a species list of Italian [malacofauna](#).
- 1899: American physicists [Marcia Keith](#) and [Isabelle Stone](#) became charter members of the [American Physical Society](#).
- 1899: Irish physicist [Edith Anne Stoney](#) was appointed a physics lecturer at the [London School of Medicine for Women](#), becoming the first female [medical physicist](#). She later became a pioneering figure in the use of [X-ray machines](#) on the front lines of [World War I](#).

Early 20th century

1900s

- 1900: American botanist [Anna Murray Vail](#) became the first librarian of the [New York Botanical Garden](#). A key supporter of the institution's establishment, she had earlier donated her entire collection of 3000 botanical specimens to the garden.
- 1900: Physicists [Marie Skłodowska-Curie](#) and [Isabelle Stone](#) attended the first International Congress of Physics in [Paris](#), France. They were the only two women out of 836 participants.
- 1901: American Florence Bascom became the first female geologist to present a paper before the Geological Survey of Washington.
- 1901: Czech botanist and zoologist [Marie Zdeňka Baborová-Čiháková](#) became the first woman in the Czech Republic to receive a PhD.
- 1901: American astronomer [Annie Jump Cannon](#) published her first catalog of stellar spectra, which [classified stars](#) by temperature. This method was universally and permanently adopted by other astronomers.

- 1903: [Grace Coleridge Frankland](#) née Toynbee was an English microbiologist. Her most notable work was *Bacteria in Daily Life*. She was one of the nineteen female scientists who wrote the [1904 petition to the Chemical Society](#) to request that they should create some female fellows of the society.
- 1903: Polish-born physicist and chemist [Marie Skłodowska–Curie](#) became the first woman to receive a Nobel Prize when she received the [Nobel Prize in Physics](#) along with her husband, [Pierre Curie](#), "for their joint researches on the [radiation](#) phenomena discovered by Professor Henri Becquerel", and [Henri Becquerel](#), "for his discovery of spontaneous [radioactivity](#)".
- 1904: American geographer, geologist and educator [Zonia Baber](#) published her article "The Scope of Geography", in which she laid out her educational theories on the teaching of geography. She argued that students required a more interdisciplinary, experiential approach to learning geography: instead of a reliance on textbooks, students needed field-trips, lab work and map-making knowledge. Baber's educational ideas transformed the way schools taught geography.
- 1904: British chemists [Ida Smedley](#), [Ida Freund](#) and [Martha Whiteley](#) organized a [petition asking the Chemical Society to admit women as Fellows](#). A total of 19 female chemists became signatories, but their petition was denied by the society.
- 1904: [Marie Charlotte Carmichael Stopes](#) (15 October 1880 – 2 October 1958) was a British author, [palaeobotanist](#) and campaigner for [women's rights](#). She made significant contributions to plant palaeontology and coal classification. She held the post of Lecturer in Palaeobotany at the [University of Manchester](#) from 1904 to 1910; in this capacity she became the first female academic of that university. In 1909 she was elected to the [Linnean Society of London](#). She was 26 at the time of her election to Fellowship (the youngest woman admitted at that time).
- 1904: In a December meeting, the [Linnean Society of London](#) elected its first women Fellows. These initial women included horticulturalist [Ellen Willmott](#), ornithologist [Emma Turner](#), biologist [Lilian Jane Gould](#), mycologists [Gulielma Lister](#) and [Annie Lorrain Smith](#), and botanists [Mary Anne Stebbing](#), [Margaret Jane Benson](#) and [Ethel Sargant](#).^{[141][142]}
- 1905: American geneticist [Nettie Stevens](#) discovered sex chromosomes.
- 1906: Following the [San Francisco earthquake](#), American botanist and curator [Alice Eastwood](#) rescued almost 1500 rare plant specimens from the burning [California Academy of Sciences](#) building. Her curation system of keeping type specimens separate from other collections – unconventional at the time – allowed her to quickly find and retrieve the specimens.
- 1906: Russian chemist [Irma Goldberg](#) published a paper on two newly discovered chemical reactions involving the presence of copper and the creation of a nitrogen-carbon bond to an aromatic halide. These reactions were subsequently named the [Goldberg reaction](#) and the Jourdan-Ullman-Goldberg reaction.
- 1906: English physicist, mathematician and engineer [Hertha Ayrton](#) became the first female recipient of the [Hughes Medal](#) from the [Royal Society of London](#). She received the award for her experimental research on [electric arcs](#) and sand ripples.
- 1906: After her death, English [lepidopterist](#) [Emma Hutchinson](#)'s collection of 20,000 butterflies and moths was donated to the [London Natural History Museum](#). She had published little during her lifetime, and was barred from joining local scientific societies due to her gender, but was honoured for her work when a variant form of the [comma butterfly](#) was named *hutchinsoni*.
- 1909: [Alice Wilson](#) became the first female geologist hired by the [Geological Survey of Canada](#).^{[148][149]} She is widely credited as being the first Canadian female geologist.
- 1909: Danish physicist [Kirstine Meyer](#) became the first Danish woman to receive a doctorate degree in natural sciences. She wrote her dissertation on the topic of "the development of the temperature concept" within the history of physics.

1910s

- 1911: Polish-born physicist and chemist [Marie Curie](#) became the first woman to receive the [Nobel Prize in Chemistry](#), which she received "[for] the discovery of the elements [radium](#) and [polonium](#), by the isolation of radium and the study of the nature and compounds of this remarkable element".^{[151][152][153]} This made her the first person to win the Nobel Prize twice. As of 2022, she is the only woman to win it twice and the only person to win the Nobel Prize in two scientific fields.
- 1911: Norwegian biologist [Kristine Bonnevie](#) became the first woman member of the [Norwegian Academy of Science and Letters](#).
- 1912: American astronomer [Henrietta Swan Leavitt](#) studied the bright-dim cycle periods of Cepheid stars, then found a way to calculate the distance from such stars to Earth.^[151]
- 1912: Canadian botanist and geneticist [Carrie Derick](#) was appointed a professor of morphological botany at [McGill University](#). She was the first woman to become a full professor in any department at a Canadian university.
- 1913: [Regina Fleszarowa](#) became the first Polish woman to receive a PhD in natural sciences.
- 1913: [Izabela Textorisová](#), the first Slovakian female botanist, published "Flora Data from the County of Turiec" in the journal *Botanikai Közlemények*. Her work uncovered more than 100 previously unknown species of plants from the [Turiec](#) area.
- 1913: Canadian physician and chemist [Maud Menten](#) co-authored a paper on [enzyme kinetics](#), leading to the development of the [Michaelis–Menten kinetics equation](#).
- 1914–1918: During World War I, a team of seven British women chemists conducted pioneering research on chemical antidotes and weaponized gases. The project leader, [Martha Whiteley](#), was awarded the [Order of the British Empire](#) for her wartime contributions.
- 1914-1918: Dame [Helen Gwynne-Vaughan](#), [GBE](#) (née Fraser) was a prominent English [botanist](#) and [mycologist](#). For her wartime service she was the first woman to be awarded a military [DBE](#) in January 1918. She served as Commandant of the [Women's Royal Air Force](#) (WRAF) from September 1918 until December 1919.
- 1914: British-born mycologist [Ethel Doidge](#) became the first woman in South Africa to receive a doctorate in any subject, receiving her [doctorate of science](#) degree from the University of the Good Hope. She wrote her thesis on "A bacterial disease of mango".
- 1916: [Isabella Preston](#) became the first female professional plant hybridist in Canada, producing the George C. Creelman trumpet lily. Her lily later received an [Award of Merit](#) from the [Royal Horticultural Society](#).
- 1916: [Chika Kuroda](#) became the first Japanese woman to earn a bachelor of science degree, studying chemistry at the [Tohoku Imperial University](#). After graduation, she was subsequently appointed an assistant professor at the university.
- 1917: American [zoologist](#) [Mary J. Rathbun](#) received her PhD from the [George Washington University](#). Despite never having attended college – or any formal schooling beyond high school – Rathbun had authored more than 80 scientific publications, described over 674 new species of [crustacean](#), and developed a system for crustacean-related records at the [Smithsonian Museum](#).
- 1917: Dutch biologist and phytopathologist [Johanna Westerdijk](#) became the first female university professor in the [Netherlands](#). She was appointed an [extraordinary professor](#) of [phytopathology](#) at the [University of Utrecht](#).
- 1918: German physicist and mathematician [Emmy Noether](#) created [Noether's theorem](#) explaining the connection between [symmetry](#) and [conservation laws](#).
- 1919: Dutch biologist and geneticist [Jantina Tammes](#) became the university professor in the [Netherlands](#). She was appointed an [extraordinary professor](#) of [variability and](#)

[heredity](#) at the [University of Groningen](#). She became the first person in the Netherlands to occupy a chair in genetic. Moreover, she became the second female professor in the country, and the first one at the University of Groningen. She held this position until 1937, when she resigned at the age of sixty-six.

- 1919: [Justicia Espada Acuña](#) graduates from [Universidad de Chile](#), becoming the first woman with degree in civil engineer in South America
- 1919: [Kathleen Maisey Curtis](#) became the first New Zealand woman to earn a [Doctorate of Science degree](#) (DSc), completing her thesis on [Synchytrium endobioticum](#) (potato wart disease) at the [Imperial College of Science and Technology](#). Her research was cited as "the most outstanding result in mycological research that had been presented for ten years".

1920s

- 1920: [Louisa Bolus](#) was elected a Fellow of the [Royal Society of South Africa](#) for her contributions to botany. Over the course of her lifetime, Bolus identified and named more than 1,700 new South African plant species – more species than any other botanist in South Africa.
- 1923: [María Teresa Ferrari](#), an Argentine physician, earned the first diploma awarded to a woman by the Faculty of Medicine at the University of Paris for her studies of the [urinary tract](#).
- 1924: Florence Bascom became the first woman elected to the Council of the [Geological Society of America](#).
- 1925: Mexican-American botanist [Ynes Mexia](#) embarked on her first botanical expedition into Mexico, collecting over 1500 plant specimens. Over the course of the next thirteen years, Mexia collected more than 145,000 specimens from Mexico, Alaska, and multiple South American countries. She discovered 500 new species.
- 1925: American medical scientist [Florence Sabin](#) became the first woman elected to the [National Academy of Sciences](#).
- 1925: British-American astronomer and astrophysicist [Cecilia Payne-Gaposchkin](#) established that [hydrogen](#) is the most common element in stars, and thus the most abundant element in the universe.
- 1926: American scientist [Katharine Burr Blodgett](#) became the first woman to earn a PhD in physics at the [University of Cambridge](#), under the supervision of [Sir Ernest Rutherford](#).
- 1927: [Kono Yasui](#) became the first Japanese woman to earn a [doctorate in science](#), studying at the [Tokyo Imperial University](#) and completing her thesis on "Studies on the structure of lignite, brown coal, and bituminous coal in Japan".
- 1928: [Alice Evans](#) became the first woman elected president of the [Society of American Bacteriologists](#).
- 1928: [Helen Battle](#) became the first woman to earn a PhD in marine biology in Canada.
- 1928: British biologist [Kathleen Carpenter](#) published the first English-language textbook devoted to freshwater ecology: *Life in Inland Waters*.
- 1929: American botanist [Margaret Clay Ferguson](#) became the first female president of the [Botanical Society of America](#).
- 1929: Scottish-Nigerian [Agnes Yewande Savage](#) became the first West African woman to graduate from medical school, obtaining her degree at the [University of Edinburgh](#).

1930s

- 1930: [Concepción Mendizábal Mendoza](#) became the first woman in Mexico to earn a [civil engineering](#) degree.

- 1932: [Michiyo Tsujimura](#) became the first Japanese woman to earn a [doctorate](#) in agriculture. She studied at the Tokyo Imperial University, and her doctoral thesis was entitled "On the Chemical Components of Green Tea".
- 1933: Hungarian scientist [Elizabeth Rona](#) received the [Haitinger Prize](#) from the [Austrian Academy of Sciences](#) for her method of extracting [polonium](#).
- 1933: American bacteriologist [Ruth Ella Moore](#) became the first African-American woman to receive a PhD in the natural sciences, completing her doctorate in bacteriology at [Ohio State University](#).
- 1935: French chemist [Irène Joliot-Curie](#) received the [Nobel Prize in Chemistry](#) along with [Frédéric Joliot-Curie](#) "for their synthesis of new [radioactive](#) elements".
- 1935: American plant hybridist [Grace Sturtevant](#), the "First Lady of Iris", received the [American Iris Society](#)'s gold medal for her lifetime's work.
- 1936: [Edith Patch](#) became the first female president of the [Entomological Society of America](#).
- 1936: Mycologist [Kathleen Maisey Curtis](#) was elected the first female Fellow at the [Royal Society of New Zealand](#).
- 1936: Danish [seismologist](#) and [geophysicist](#) [Inge Lehmann](#) discovered that the Earth has a solid inner core distinct from its molten [outer core](#).
- 1937: Canadian forensic pathologist [Frances Gertrude McGill](#) assisted the [Royal Canadian Mounted Police](#) in establishing their first forensic detection laboratory.
- 1937: [Suzanne Comhaire-Sylvain](#) became the first female Haitian [anthropologist](#) and the first Haitian person to complete a PhD, receiving her doctoral degree from the [University of Paris](#).
- 1937: [Marietta Blau](#) and her student [Hertha Wambacher](#), both Austrian physicists, received the [Lieben Prize](#) of the [Austrian Academy of Sciences](#) for their work on cosmic ray observations using the technique of nuclear emulsions.
- 1938: [Elizabeth Abimbola Awoliyi](#) became the first woman to be licensed to practise medicine in [Nigeria](#) after graduating from [Trinity College Dublin](#) and the first West African female medical officer with a license of the Royal Surgeon (Dublin).
- 1938: Geologist [Alice Wilson](#) became the first woman appointed as Fellow to the [Royal Society of Canada](#).
- 1938: South African naturalist [Marjorie Courtenay-Latimer](#) discovered a living [coelacanth](#) fish caught near the [Chalumna river](#). The species had been believed to be extinct for over 60 million years. It was named [latimeria chalumnae](#) in her honour.
- 1939: Austrian-Swedish physicist [Lise Meitner](#), along with [Otto Hahn](#), led the small group of scientists who first discovered [nuclear fission](#) of uranium when it absorbed an extra [neutron](#); the results were published in early 1939.
- 1939: French physicist [Marguerite Perey](#) discovered [francium](#).

1940s

- 1940: Turkish [Archaeologist](#), [Sumerologist](#), [Assyriologist](#), and writer [Muazzez İlmiye Çığ](#). Upon receiving her degree in 1940, she began a multi-decade career at Museum of the Ancient Orient, one of three such institutions comprising [Istanbul Archaeology Museums](#), as a resident specialist in the field of [cuneiform tablets](#), thousands of which were being stored untranslated and unclassified in the facility's archives. In the intervening years, due to her efforts in the deciphering and publication of the tablets, the Museum became a [Middle Eastern languages](#) learning center attended by ancient history researchers from every part of the world.
- 1941: American scientist [Ruth Smith Lloyd](#) became the first African-American woman to receive a PhD in anatomy.

- 1942: Austrian-American actress and inventor [Hedy Lamarr](#) and composer [George Antheil](#) developed a radio guidance system for [Allied torpedoes](#) that used [spread spectrum](#) and [frequency hopping](#) technology to defeat the threat of jamming by the [Axis powers](#). Although the [US Navy](#) did not adopt the technology until the 1960s, the principles of their work are incorporated into [Bluetooth](#) technology and are similar to methods used in legacy versions of [CDMA](#) and [Wi-Fi](#). This work led to their induction into the [National Inventors Hall of Fame](#) in 2014.
- 1942: American geologist [Marguerite Williams](#) became the first African-American woman to receive a PhD in geology in the United States. She completed her doctorate, entitled *A History of Erosion in the [Anacostia Drainage Basin](#)*, at [Catholic University](#).
- 1942: Native American aerospace engineer [Mary Golda Ross](#) became employed at [Lockheed Aircraft Corporation](#), where she provided troubleshooting for military aircraft. She went on to work for [NASA](#), developing operational requirements, flight plans, and a Planetary Flight Handbook for spacecraft missions such as the [Apollo program](#).
- 1943: British geologist [Eileen Guppy](#) was promoted to the rank of assistant geologist, therefore becoming the first female geology graduate appointed to the scientific staff of the [British Geological Survey](#).
- 1943: American geologist and crystallographer [Elizabeth Armstrong Wood](#) became the first female to be hired as a Member of the Technical Staff (MTS) at Bell Telephone Laboratories in Murray Hill, NJ.
- 1944: Indian chemist [Asima Chatterjee](#) became the first Indian woman to receive a [doctorate of science](#), completing her studies at the [University of Calcutta](#). She went on to establish the Department of Chemistry at [Lady Brabourne College](#).
- 1945: American physicists and mathematicians [Frances Spence](#), [Ruth Teitelbaum](#), [Marlyn Meltzer](#), [Betty Holberton](#), [Jean Bartik](#) and [Kathleen Antonelli](#) programmed the electronic general-purpose computer [ENIAC](#), becoming some of the world's first computer programmers. (The first were uncredited operators, mostly members of the [Women's Royal Naval Service](#), of the [Colossus computer](#) in 1943–1945, but that machine was not a stored-program computer and its existence was a state secret until the 1970s.)
- 1945: [Marjory Stephenson](#) and [Kathleen Lonsdale](#) were elected as the first female Fellows of the [Royal Society](#).
- 1947: Austrian-American biochemist [Gerty Cori](#) became the first woman to receive the [Nobel Prize in Physiology or Medicine](#), which she received along with [Carl Ferdinand Cori](#) "for their discovery of the course of the catalytic conversion of [glycogen](#)", and [Bernardo Alberto Houssay](#) "for his discovery of the part played by the [hormone](#) of the [anterior pituitary](#) lobe in the metabolism of [sugar](#)".
- 1947: American biochemist [Marie Maynard Daly](#) became the first African-American woman to complete a PhD in chemistry in the United States. She completed her dissertation, entitled "A Study of the Products Formed by the Action of Pancreatic Amylase on Corn Starch" at [Columbia University](#).
- 1947: [Berta Karlik](#), an Austrian physicist, was awarded the [Haitinger Prize](#) of the Austrian Academy of Sciences for her discovery of astatine.
- 1947: [Susan Ofori-Atta](#) became the first Ghanaian woman to earn a medical degree when she graduated from the [University of Edinburgh](#).
- 1948: Canadian [plant pathologist](#) and mycologist [Margaret Newton](#) became the first woman to be awarded the [Flavelle Medal](#) from the [Royal Society of Canada](#), in recognition of her extensive research in [wheat rust fungal disease](#). Her experiments led to the development of rust-resistant strains of wheat.
- 1948: American limnologist [Ruth Patrick](#) of the [Academy of Natural Sciences of Philadelphia](#) led a multidisciplinary team of scientists on an extensive pollution survey of the Conestoga River watershed in Pennsylvania. Patrick would become a leading authority

on the ecological effects of river pollution, receiving the Tyler Prize for Environmental Achievement in 1975.

- 1949: Botanist [Valida Tutayug \[az\]](#) became the first Azerbaijani woman to receive a PhD in biological studies. She went on to write the first national Azerbaijani-language textbooks on botany and biology.
- [Winifred Goldring](#) (February 1, 1888 – January 30, 1971), was an American [paleontologist](#) and became the first female president of the [Paleontological Society](#), her work included a description of [stromatolites](#), as well as the study of [Devonian crinoids](#). She was the first woman in the US to be appointed as a State Paleontologist.

Late 20th century

1950s

- 1950s: Chinese-American medical scientist [Tsai-Fan Yu](#) co-founded a clinic at [Mount Sinai Medical Center](#) for the study and treatment of [gout](#). Working with [Alexander B. Gutman](#), Yu established that levels of [uric acid](#) were a factor in the pain experienced by gout patients, and subsequently developed multiple effective drugs for the treatment of gout.
- 1950: Chinese-American particle physicist [Chien-Shiung Wu](#) proved the validity of [Quantum entanglement](#) which counters [Albert Einstein's EPR Paradox](#) and published her work on the new year of the new decade. She also proved the validity of [beta decay](#) around this time.
- 1950: Ghanaian, [Matilda J. Clerk](#) became the first woman in Ghana and West Africa to attend graduate school, earning a postgraduate diploma at the [London School of Hygiene & Tropical Medicine](#).
- 1950: [Isabella Abbott](#) became the first Native Hawaiian woman to receive a PhD in any science; hers was in botany.
- 1950: American microbiologist [Esther Lederberg](#) became the first to isolate [lambda bacteriophage](#), a DNA virus, from [Escherichia coli K-12](#).
- 1951: Ghana's [Esther Afua Ocloo](#) became the first person of African ancestry to obtain a cooking diploma from the [Good Housekeeping Institute](#) in [London](#) and to take the post-graduate Food Preservation Course at [Long Ashton Research Station](#), Department of Horticulture, [Bristol University](#).
- 1952: American computer scientist [Grace Hopper](#) completed what is considered to be the first compiler, a program that allows a computer user to use a human-readable [high-level programming language](#) instead of machine code. It was known as the A-0 compiler.
- 1952: [Photograph 51](#), an [X-ray diffraction](#) image of [crystallized DNA](#), was taken by [Raymond Gosling](#) in May 1952, working as a PhD student under the supervision of British chemist and biophysicist [Rosalind Franklin](#); it was critical evidence in identifying the structure of DNA.
- 1952: Canadian [agriculturalist](#) [Mary MacArthur](#) became the first female Fellow of the [Agricultural Institute of Canada](#) for her contributions to the science of food dehydration and freezing.
- 1953: Canadian-British [radiobiologist](#) [Alma Howard](#) co-authored a paper proposing that [cellular life](#) transitions through four distinct periods. This became the first concept of the [cell cycle](#).
- 1954: [Lucy Cranwell](#) was the first female recipient of the [Hector Medal](#) from the [Royal Society of New Zealand](#). She was recognized for her pioneering work with pollen in the emerging field of [palynology](#).
- 1955: [Moirá Dunbar](#) became the first female [glaciologist](#) to study sea ice from a Canadian [icebreaker](#) ship.

- 1955: Japanese geochemist [Katsuko Saruhashi](#) published her research on measuring [carbonic acid](#) levels in seawater. The paper included "Saruhashi's Table", a tool of measurement she had developed that focused on using water temperature, pH level, and chlorinity to determine carbonic acid levels. Her work contributed to global understanding of climate change, and Saruhashi's Table was used by oceanographers for the next 30 years.
- 1955–1956: Soviet marine biologist [Maria Klenova](#) became the first female scientist to work in the Antarctic, conducting research and assisting in the establishment of the [Mirny](#) Antarctic station.
- 1956: Canadian zoologist and feminist [Anne Innis Dagg](#) began pioneering behavioural research on wild giraffes in South Africa in Kruger National Park. She researched and published on feminism and anti-nepotism laws at academic institutions in North America.
- 1956: Chinese-American physicist Chien-Shiung Wu conducted a [nuclear physics](#) experiment in collaboration with the Low Temperature Group of the US [National Bureau of Standards](#). It was an important foundation for the [Standard Model](#) in [particle physics](#) and brought the first answer to the question of the universe's existence by virtue of [matter's predominance over antimatter](#). The experiment, becoming known as the [Wu experiment](#), showed that parity could be violated in weak interaction. The Nobel Prize was given only to her male colleagues soon after the headlines of the discovery were released.
- 1956: [Dorothy Hill](#) became the first Australian woman elected a Fellow of the [Australian Academy of Science](#).
- 1956: English zoologist and geneticist [Margaret Bastock](#) published the first evidence that a single gene could change behavior.
- 1957–1958: Chinese scientist [Lanying Lin](#) produced China's first [germanium](#) and [silicon](#) mono-crystals, subsequently pioneering new techniques in [semiconductor](#) development.
- 1959: Chinese astronomer [Ye Shuhua](#) led the development of the Joint Chinese Universal Time System, which became the Chinese national standard for measuring [universal time](#).
- 1959: [Susan Ofori-Atta](#), the first female Ghanaian physician, became a founding member of the [Ghana Academy of Arts and Sciences](#).

1960s

- 1960: British [primatologist Jane Goodall](#) began studying chimpanzees in Tanzania; her study of them continued for over 50 years. Her observations challenged previous ideas that only humans made tools and that chimpanzees had a basically vegetarian diet.
- Early 1960s: German-Canadian [metallurgist Ursula Franklin](#) studied levels of radioactive isotope [strontium-90](#) that were appearing in the teeth of children as a side effect of nuclear weapons testing fallout. Her research influenced the [Partial Nuclear Test Ban Treaty of 1963](#).
- 1960s: American mathematician [Katherine Johnson](#) calculated flight paths at NASA for crewed space flights.
- 1961: Indian chemist [Asima Chatterjee](#) became the first female recipient of a [Shanti Swarup Bhatnagar Prize](#). She was recognized in the Chemical Sciences category for her contributions to [phytomedicine](#).
- 1962: [Rachel Louise Carson](#) was an American [marine biologist](#), author, and [conservationist](#) whose book [Silent Spring](#) and other writings are credited with advancing the global [environmental movement](#).
- 1962: South African botanist [Margaret Levyns](#) became the first female president of the [Royal Society of South Africa](#).

- 1962: French physicist [Marguerite Perey](#) became the first female Fellow elected to the [Académie des Sciences](#).
- 1963: [Elsa G. Vilmundardóttir](#) became the first female Icelandic geologist, completing her studies at [Stockholm University](#).
- 1963: [Maria Goeppert Mayer](#) became the first American woman to receive a [Nobel Prize in Physics](#); she shared the prize with [J. Hans D. Jensen](#) "for their discoveries concerning [nuclear shell structure](#)" and [Eugene Paul Wigner](#) "for his contributions to the theory of the atomic nucleus and the elementary particles, particularly through the discovery and application of fundamental [symmetry principles](#)".
- 1964: American mathematician [Irene Stegun](#) completed the work which led to the publication of [Handbook of Mathematical Functions](#), a widely used and widely cited reference work in applied mathematics.
- 1964: British chemist [Dorothy Crowfoot Hodgkin](#) received the [Nobel Prize in Chemistry](#) "for her determinations by [X-ray techniques](#) of the structures of important biochemical substances".
- 1964: Scottish virologist [June Almeida](#) made the first identification of a human [coronavirus](#).
- 1965: Sister [Mary Kenneth Keller](#) became the first American woman to receive a Ph.D. in computer science. Her thesis was titled "Inductive Inference on Computer Generated Patterns".
- 1966: Japanese immunologist [Teruko Ishizaka](#), working with [Kimishige Ishizaka](#), discovered the antibody class [Immunoglobulin E](#) (IgE).
- 1967: British astrophysicist [Jocelyn Bell Burnell](#) co-discovered the first radio [pulsars](#).^[282]
- 1967: Sue Arnold became the first female [British Geological Survey](#) person to go to sea on a research vessel.
- 1967: South African radiobiologist [Tikvah Alper](#) discovered that [scrapie](#), an infectious brain disease affecting sheep, did not spread via DNA or RNA like a viral or bacterial disease. The discovery enabled scientists to better understand diseases caused by [prions](#).
- 1967: [Yvonne Brill](#), a Canadian-American rocket and jet propulsion engineer, invented the [hydrazine resistojet](#) propulsion system.
- 1968: Japanese pioneer of molecular biology [Tsuneko Okazaki](#) studied DNA replication and discovered [Okazaki fragments](#).
- 1969: Beris Cox became the first female [paleontologist](#) in the [British Geological Survey](#).
- 1969: Ukrainian-born astronomer [Svetlana Gerasimenko](#) co-discovered the [67P/Churyumov–Gerasimenko](#) comet.

1970s

- 1970: [Dorothy Hill](#) became the first female president of the [Australian Academy of Science](#).
- 1970: [Samira Islam](#) became the first Saudi Arabian person to earn a PhD in [pharmacology](#).
- 1970: Astronomer [Vera Rubin](#) published the first evidence for [dark matter](#).
- 1970: Polish geologist [Franciszka Szymakowska](#) became widely known because of her unique and detailed geological drawings that are still used today.
- 1973: American physicist [Anna Coble](#) became the first African-American woman to receive a PhD in biophysics, completing her dissertation at [University of Illinois](#).
- 1974: Dominican marine biologist [Idelisa Bonnelly](#) founded the [Dominican Republic Academy of Science](#).
- 1975: Indian chemist [Asima Chatterjee](#) was elected the General President of the [Indian Science Congress Association](#). She simultaneously became the first female scientist ever elected a member of the congress.

- 1975: Indian geneticist [Archana Sharma](#) received the [Shanti Swarup Bhatnagar Prize](#), the first female recipient in the Biological Sciences category.
- 1975: Female officers of the [British Geological Survey](#) no longer had to resign upon getting married.
- 1975: Chien-Shiung Wu became the first female president of the [American Physical Society](#).
- 1976: Filipino-American microbiologist [Roseli Ocampo-Friedmann](#) traveled to the [Antarctic](#) with [Imre Friedmann](#) and discovered micro-organisms living within the porous rock of the Ross Desert. These organisms – [cryptoendoliths](#) – were observed surviving extremely low temperatures and humidity, assisting scientific research into the possibility of life on [Mars](#).
- 1976: [Margaret Burbidge](#) was named the first female president of the [American Astronomical Society](#).^[297]
- 1977: American medical physicist [Rosalyn Yalow](#) received the [Nobel Prize in Physiology or Medicine](#) "for the development of [radioimmunoassays](#) of [peptide hormones](#)" along with [Roger Guillemin](#) and [Andrew V. Schally](#) who received it "for their discoveries concerning the [peptide hormone](#) production of the [brain](#)".
- 1977: Friederike Victoria [Joy Adamson](#) (née Gessner, 20 January 1910 – 3 January 1980) was a naturalist, artist and author. Her book, *Born Free*, an international bestseller, describes her experiences raising a lion cub named Elsa. It was made into an [Academy Award](#)-winning [movie](#) of the same name. In 1977, she was awarded the Austrian Cross of Honour for Science and Art.
- 1977: The [Association for Women Geoscientists](#) was founded.
- 1977: Argentine-Canadian scientist [Veronica Dahl](#) became the first graduate at Université d'Aix-Marseille II (and one of the first women in the world) to earn a PhD in [artificial intelligence](#).
- 1977: Canadian-American [Elizabeth Stern](#) published her research on the link between [birth control pills](#) – which contained high levels of [estrogen](#) at the time – and the increased risk of [cervical cancer](#) development in women. Her data helped pressure the pharmaceutical industry into providing safer contraceptive pills with lower hormone doses.
- 1978: [Anna Jane Harrison](#) became the first female president of the [American Chemical Society](#).
- 1978: [Mildred Cohn](#) served as the first female president of the [American Society for Biochemistry and Molecular Biology](#), then called the American Society of Biological Chemists.

1980s

- 1980: Japanese geochemist [Katsuko Saruhashi](#) became the first woman elected to the [Science Council of Japan](#).
- 1980: Nigerian geophysicist [Deborah Ajakaiye](#) became the first woman in any West African country to be appointed a full professor of physics. Over the course of her scientific career, she became the first female Fellow elected to the [Nigerian Academy of Science](#), and the first female dean of science in Nigeria.
- 1981: [Vera Rubin](#) was the second female astronomer elected to the National Academy of Science. Beginning her academic career as the sole undergraduate in astronomy at [Vassar College](#), Rubin went on to graduate studies at [Cornell University](#) and [Georgetown University](#), where she observed deviations from [Hubble flow](#) in galaxies and provided evidence for the existence of [galactic superclusters](#).
- 1982: Nephrologist [Leah Lowenstein](#) became the first female dean of a [co-educational](#) medical school in the United States.

- 1982: [Janet Vida Watson FRS^{\[314\]} FGS](#) (1923–1985) was a British geologist. She was a professor of geology at [Imperial College](#), London. A fellow of the [Royal Society](#), she is well known for her contribution to the understanding of the [Lewisian complex](#) and as an author and co-author of several books. In 1982 she was elected President of the [Geological Society of London](#), the first woman to occupy that position.
- 1983: American [cytogeneticist Barbara McClintock](#) received the [Nobel Prize in Physiology or Medicine](#) for her discovery of [genetic transposition](#); she was the first woman to receive that prize without sharing it, and the first American woman to receive any unshared Nobel Prize.
- 1983: Brazilian agronomist [Johanna Döbereiner](#) became a founding Fellow of the [World Academy of Sciences](#).
- 1983: Indian immunologist [Indira Nath](#) became the first female scientist to receive the [Shanti Swaroop Bhatnagar Award](#) in the Medical Sciences category.
- 1983: Geologist [Sudipta Sengupta](#) and marine biologist [Aditi Pant](#) became the first Indian women to visit the [Antarctic](#).
- 1985: After identifying [HIV](#) as the cause of [AIDS](#), Chinese-American virologist [Flossie Wong-Staal](#) became the first scientist to clone and genetically map the HIV virus, enabling the development of the first HIV blood screening tests.
- 1986: Italian neurologist [Rita Levi-Montalcini](#) received the [Nobel Prize in Physiology or Medicine](#), shared with [Stanley Cohen](#), "for their discoveries of [growth factors](#)".
- 1988: American [biochemist](#) and [pharmacologist Gertrude B. Elion](#) received the [Nobel Prize in Physiology or Medicine](#) along with [James W. Black](#) and [George H. Hitchings](#) "for their discoveries of important principles for [drug treatment](#)".
- 1988: American scientist and inventor [Patricia Bath](#) (born 1942) became the first African-American to patent a medical device, namely the Laserphaco Probe for improving the use of lasers to remove cataracts.

1990s

- 1991: [Doris Malkin Curtis](#) became the first female president of the [Geological Society of America](#).
- 1991: Indian geologist [Sudipta Sengupta](#) became the first female scientist to receive the [Shanti Swaroop Bhatnagar Award](#) in the Earth Sciences category.
 - [Helen Patricia Sharman](#), [CMG](#), [OBE](#), [HonFRSC](#) (born 30 May 1963) is a [chemist](#) who became the first British [astronaut](#) (and in particular, the first British [cosmonaut](#)) as well as the first woman to visit the [Mir](#) space station in May 1991.
 - 1992: [Mae Carol Jemison](#) is an American engineer, physician, and former NASA astronaut. She became the first black woman to travel into space when she served as a mission specialist aboard the Space Shuttle Endeavour. Jemison joined NASA's astronaut corps in 1987 and was selected to serve for the STS-47 mission, during which she orbited the Earth for nearly eight days on September 12–20, 1992.
 - 1992: [Edith M. Flanigen](#) became the first woman awarded the [Perkin Medal](#) (widely considered the highest honor in American industrial chemistry) for her outstanding achievements in applied chemistry. The medal especially recognized her syntheses of aluminophosphate and silicoaluminophosphate [molecular sieves](#) as new classes of materials.
 - 1995: German biologist [Christiane Nüsslein-Volhard](#) received the [Nobel Prize in Physiology or Medicine](#), shared with [Edward B. Lewis](#) and [Eric F. Wieschaus](#), "for their discoveries concerning the genetic control of early [embryonic development](#)".
 - 1995: British geomorphologist [Marjorie Sweeting](#) published the first comprehensive Western account of China's [karst](#), entitled *Karst in China: its Geomorphology and Environment*.

- 1995: Israeli-Canadian mathematical biologist [Leah Keshet](#) became the first female president of the international [Society for Mathematical Biology](#).
- 1995: [Jane Plant](#) became the first female deputy director of the [British Geological Survey](#).
- 1995: Inspectors from the [United Nations Special Commission](#) discovered that Iraqi microbiologist [Rihab Taha](#), nicknamed "Dr. Germ", had been overseeing a secret 10-year [biological warfare development program in Iraq](#).
- 1996: American planetary scientist [Margaret G. Kivelson](#) led a team that discovered the first subsurface, saltwater ocean on an alien world, on the Jovian moon [Europa](#).
- 1997: Lithuanian-Canadian primatologist [Birutė Galdikas](#) received the [Tyler Prize for Environmental Achievement](#) for her research and rehabilitation work with orangutans. Her work with orangutans, eventually spanning over 30 years, was later recognized in 2014 as one of the longest continuous scientific studies of wild animals in history.
- 1997: Chilean astronomer [María Teresa Ruiz](#) discovered [Kulu 1](#), one of the first observed [brown dwarfs](#). In recognition of her discovery, she became the first woman to receive the Chilean [National Prize for Exact Sciences](#).
- 1998: Nurse [Fannie Gaston-Johansson](#) became the first African-American woman [tenured](#) full professor at Johns Hopkins University.
- Late 1990s: Ethiopian-American chemist [Sossina M. Haile](#) developed the first [solid acid fuel cell](#).

21st century

2000s

- 2000: Venezuelan astrophysicist [Kathy Vivas](#) presented her discovery of approximately 100 "new and very distant" [RR Lyrae stars](#), providing insight into the structure and history of the Milky Way galaxy.
- 2003: American geophysicist [Claudia Alexander](#) oversaw the final stages of [Project Galileo](#), a space exploration mission that ended at the planet Jupiter.
- 2004: American biologist [Linda B. Buck](#) received the [Nobel Prize in Physiology or Medicine](#) along with [Richard Axel](#) "for their discoveries of [odorant receptors](#) and the organization of the [olfactory system](#)".
- 2006: Chilean biochemist [Cecilia Hidalgo Tapia](#) became the first woman to receive the Chilean [National Prize for Natural Sciences](#).
- 2006: Chinese-American biochemist [Yizhi Jane Tao](#) led a team of researchers to become the first to map the atomic structure of [Influenza A](#), contributing to [antiviral](#) research.
- 2006: Parasitologist [Susan Lim](#) became the first Malaysian scientist elected to the [International Commission on Zoological Nomenclature](#).
- 2006: [Merieme Chadid](#) became the first Moroccan person and the first female astronomer to travel to Antarctica, leading an international team of scientists in the installation of a major [observatory](#) in the South Pole.
- 2006: American computer scientist [Frances E. Allen](#) won the [Turing Award](#) for "pioneering contributions to the theory and practice of optimizing compiler techniques that laid the foundation for modern optimizing compilers and automatic parallel execution". She was the first woman to win the award.
- 2006: Canadian-American computer scientist [Maria Klawe](#) became the president of [Harvey Mudd College](#).
- 2007: Using satellite imagery, Egyptian geomorphologist [Eman Ghoneim](#) discovered traces of an 11,000-year-old mega lake in the [Sahara Desert](#). The discovery shed light on the origins of the largest modern [groundwater](#) reservoir in the world.
- 2007: Physicist [Ibtisam Badhrees](#) was the first Saudi Arabian woman to become a member of the [European Organization for Nuclear Research \(CERN\)](#).

- 2008: French virologist [Françoise Barré-Sinoussi](#) received the [Nobel Prize in Physiology or Medicine](#), shared with [Harald zur Hausen](#) and [Luc Montagnier](#), "for their discovery of [HIV](#), human immunodeficiency virus".
- 2008: American-born Australian [Penny Sackett](#) became Australia's first female Chief Scientist.
- 2008: American computer scientist [Barbara Liskov](#) won the [Turing Award](#) for "contributions to practical and theoretical foundations of programming language and system design, especially related to data abstraction, fault tolerance, and distributed computing".
- 2009: American molecular biologist [Carol W. Greider](#) received the [Nobel Prize in Physiology or Medicine](#) along with [Elizabeth H. Blackburn](#) and [Jack W. Szostak](#) "for the discovery of how [chromosomes](#) are protected by [telomeres](#) and the [enzyme telomerase](#)".
- 2009: Israeli [crystallographer Ada E. Yonath](#), along with [Venkatraman Ramakrishnan](#) and [Thomas A. Steitz](#), received the [Nobel Prize in Chemistry](#) "for studies of the structure and function of the ribosome".
- 2009: Chinese geneticist [Zeng Fanyi](#) and her research team published their experiment results proving that [induced pluripotent stem cells](#) can be used to generate whole mammalian bodies – in this case, live mice.

2010s

2010: [Marcia McNutt](#) became the first female director of the United States Geological Survey.

- 2011: Kazakhstani neuroscience student and computer hacker [Alexandra Elbakyan](#) launched [Sci-Hub](#), a website that provides users with pirated copies of scholarly scientific papers. Within five years, Sci-Hub grew to contain 60 million papers and recorded over 42 million annual downloads by users. Elbakyan was finally sued by major academic publishing company [Elsevier](#), and Sci-Hub was subsequently taken down, but it reappeared under different domain names.
- 2011: Taiwanese-American astrophysicist [Chung-Pei Ma](#) led a team of scientists in discovering two of the largest [black holes](#) ever observed.
- 2012: Computer scientist and [cryptographer Shafi Goldwasser](#) won the Turing award for her contributions to cryptography and [complexity theory](#).
- 2013: Canadian genetic specialist [Turi King](#) identified the 500-year-old skeletal remains of [King Richard III](#).
- 2013: Kenyan ichthyologist [Dorothy Wanja Nyingi](#) published the first guide to freshwater fish species of [Kenya](#).
- 2014: Norwegian psychologist and neuroscientist [May-Britt Moser](#) received the [Nobel Prize in Physiology or Medicine](#), shared with [Edvard Moser](#) and [John O'Keefe](#), "for their discoveries of cells that constitute a positioning system in the brain".
- 2014: American [paleoclimatologist](#) and marine geologist [Maureen Raymo](#) became the first woman to be awarded the [Wollaston Medal](#), the highest award of the [Geological Society of London](#).
- 2014: American theoretical physicist [Shirley Ann Jackson](#) was awarded the [National Medal of Science](#). Jackson had been the first African-American woman to receive a PhD from the [Massachusetts Institute of Technology \(MIT\)](#) during the early 1970s, and the first woman to chair the [U.S. Nuclear Regulatory Commission](#).
- 2014: Iranian mathematician [Maryam Mirzakhani](#) became the first woman to receive the [Fields Medal](#), for her work in "the dynamics and geometry of [Riemann surfaces](#) and their [moduli spaces](#)".
- 2015: Chinese medical scientist [Tu Youyou](#) received the [Nobel Prize in Physiology or Medicine](#), shared with [William C. Campbell](#) and [Satoshi Ōmura](#); she received it "for her discoveries concerning a novel therapy against Malaria".

- 2015: [Asha de Vos](#) became the first Sri Lankan person to receive a PhD in marine mammal research, completing her thesis on "Factors influencing blue whale aggregations off southern Sri Lanka" at the [University of Western Australia](#).
- 2016: [Marcia McNutt](#) became the first female president of the American [National Academy of Sciences](#).
- 2018: British astrophysicists [Hiranya Peiris](#) and [Joanna Dunkley](#) and Italian cosmologist [Licia Verde](#) were among 27 scientists awarded the [Breakthrough Prize in Fundamental Physics](#) for their contributions to "detailed maps of the early universe that greatly improved our knowledge of the evolution of the cosmos and the fluctuations that seeded the formation of galaxies".
- 2018: British astrophysicist [Jocelyn Bell Burnell](#) received the special [Breakthrough Prize in Fundamental Physics](#) for her scientific achievements and "inspiring leadership", worth \$3 million. She donated the entirety of the prize money towards the creation of scholarships to assist women, underrepresented minorities and refugees who are pursuing the study of physics.
- 2018: Canadian physicist [Donna Strickland](#) received the [Nobel Prize in Physics](#) "for groundbreaking inventions in the field of [laser physics](#)"; she shared it with [Arthur Ashkin](#) and [G rard Mourou](#).
- 2018: [Frances Arnold](#) received the [Nobel Prize in Chemistry](#) "for the [directed evolution](#) of enzymes"; she shared it with [George Smith](#) and [Gregory Winter](#), who received it "for the phage display of peptides and antibodies". This made Frances the first American woman to receive the [Nobel Prize in Chemistry](#).
- 2018: For the first time in history, women received the [Nobel Prize in Chemistry](#) and the [Nobel Prize in Physics](#) in the same year.
- 2019: Mathematician [Karen Uhlenbeck](#) became the first woman to win the [Abel Prize](#) for "her pioneering achievements in geometric [partial differential equations](#), [gauge theory](#), and [integrable systems](#), and for the fundamental impact of her work on [analysis](#), [geometry](#) and [mathematical physics](#)".
- 2019: Imaging scientist [Katie Bouman](#) developed an algorithm that made the first visualization of a black hole possible using the [Event Horizon Telescope](#). She was part of the team of over 200 people who implemented the project.

2020s

- 2020: The [Nigerian Academy of Science](#) elected [epidemiologist/parasitologist Ekanem Braide](#) as its first female president.
- 2020: Brazilian Scientist and Researcher [Jaqueline Goes de Jesus](#), sequenced COVID-19 genome in 12 hours.
- 2020: Biochemists [Jennifer Doudna](#) (American) and [Emmanuelle Charpentier](#) (French) received the [Nobel Prize in Chemistry](#) for their work on [CRISPR](#) genome editing tool.
- 2020: [Andrea M. Ghez](#) received the [Nobel Prize in Physics](#) for the discovery of a supermassive compact object.
- 2020: German-Turkish scientist [ zlem T reci](#) is the co-founder and chief medical officer of [BioNTech](#).^[398] Her team developed BNT162b2 (tozinameran (INN)), commonly known as the [Pfizer–BioNTech COVID-19 vaccine](#).
- 2020: British vaccinologist [Sarah Gilbert](#) leads the development and testing of a vaccine which becomes the [Oxford–AstraZeneca COVID-19 vaccine](#).
- 2022: American chemist [Carolyn R. Bertozzi](#) received the [Nobel Prize in Chemistry](#) for her development of [Bioorthogonal chemistry](#).
- 2023: Australian geomicrobiologist [Jillian Banfield](#) became the first female recipient of the [van Leeuwenhoek Medal](#), which she received for her studies of complex microbial communities and their interaction with the environment.

See also:

- [List of female scientists before the 20th century](#)
- [Lists of women in science](#)
- [Timeline of women in geology](#)
- [Timeline of women in library science](#)
- [Timeline of women in computing](#)
- [Timeline of women in mathematics](#)
- [Timeline of women in mathematics in the United States](#)
- [Timeline of women in science in the United States](#)
- [Timeline of women's education](#)
- [Women in physics](#)

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Quotable QUOTES

https://todayinsci.com/C/Curie_Marie/CurieMarie-Quotations.htm

- [Anecdote]~~ Be less curious about people and more curious about ideas.
- After all, science is essentially international, and it is only through lack of the historical sense that national qualities have been attributed to it.
- All my life through, the new sights of Nature made me rejoice like a child.
- Humanity certainly needs practical men, who get the most out of their work, and, without forgetting the general good, safeguard their own interests. But humanity also needs dreamers, for whom the disinterested development of an enterprise is so captivating that it becomes impossible for them to devote their care to their own material profit. Without the slightest doubt, these dreamers do not deserve wealth, because they do not desire it. Even so, a well-organised society should assure to such workers the efficient means of accomplishing their task, in a life freed from material care and freely consecrated to research.
- I am among those who think that science has great beauty. A scientist in his laboratory is not only a technician: he is also a

child placed before natural phenomena which impress him like a fairy tale. We should not allow it to be believed that all scientific progress can be reduced to mechanisms, machines, gearings, even though such machinery has its own beauty.

- I am one of those who think, like Nobel, that humanity will draw more good than evil from new discoveries.
- I devoted myself especially to the purification of the radium.... It was only after treating one ton of pitchblende residues that I could get definite results. Indeed, we know to-day that even in the best minerals there are not more than a few decigrammes of radium in a ton of raw material.
- I have no dress except the one I wear every day. If you are going to be kind enough to give me one, please let it be practical and dark so that I can put it on afterwards to go to the laboratory.
[Referring to her wedding dress.]
- I learned easily mathematics and physics, as far as these sciences were taken in consideration in the school. I found in this ready help from my father, who loved science and had to teach it himself. He enjoyed any explanation he could give us about Nature and her ways. Unhappily, he had no laboratory and could not perform experiments.
- I shall devote only a few lines to the expression of my belief in the importance of science for mankind.... [I]t is by...daily striving after knowledge that man has raised himself to the unique position he occupies on earth, and that his power and well-being have continually increased.
- I then [in 1902] possessed one decigramme of very pure radium chloride. It had taken me almost four years to produce the kind of evidence which chemical science demands, that radium is truly a new element. ... The demonstration that cost so much effort was the basis of the new science of radioactivity.
- I was taught that the way of progress is neither swift nor easy.
- In science we must be interested in things, not in persons.

- It was like a new world opened to me, the world of science, which I was at last permitted to know in all liberty.
- It would be impossible; it would be against the scientific spirit. ... Physicists should always publish their researches completely. If our discovery has a commercial future that is a circumstance from which we should not profit. If radium is to be used in the treatment of disease, it is impossible for us to take advantage of that.
- Life is not easy for any of us, but what of that? We must have perseverance and above all confidence in ourselves. We must believe that we are gifted in something, and that this thing, at whatever cost, must be attained.
- My experiments proved that the radiation of uranium compounds ... is an atomic property of the element of uranium. Its intensity is proportional to the quantity of uranium contained in the compound, and depends neither on conditions of chemical combination, nor on external circumstances, such as light or temperature.
- ... The radiation of thorium has an intensity of the same order as that of uranium, and is, as in the case of uranium, an atomic property of the element.
- It was necessary at this point to find a new term to define this new property of matter manifested by the elements of uranium and thorium. I proposed the word radioactivity which has since become generally adopted; the radioactive elements have been called radio elements.
- Nothing in life is to be feared, it is only to be understood.
- One never notices what has been done; one can only see what remains to be done.
- One of our joys was to go into our workroom at night; we then perceived on all sides the feebly luminous silhouettes of the bottles or capsules containing our products. It was really a lovely sight and one always new to us. The glowing tubes looked like faint, fairy lights.

- Sometimes my courage fails me and I think I ought to stop working, live in the country and devote myself to gardening. But I am held by a thousand bonds, and I don't know when I shall be able to arrange things otherwise. Nor do I know whether, even by writing scientific books, I could live without the laboratory.
- The School of Physics could give us no suitable premises, but for lack of anything better, the Director permitted us to use an abandoned shed which had been in service as a dissecting room of the School of Medicine. Its glass roof did not afford complete shelter against rain; the heat was suffocating in summer, and the bitter cold of winter was only a little lessened by the iron stove, except in its immediate vicinity. There was no question of obtaining the needed proper apparatus in common use by chemists. We simply had some old pine-wood tables with furnaces and gas burners. We had to use the adjoining yard for those of our chemical operations that involved producing irritating gases; even then the gas often filled our shed. With this equipment we entered on our exhausting work. Yet it was in this miserable old shed that we passed the best and happiest years of our life.
- The various reasons which we have enumerated lead us to believe that the new radio-active substance contains a new element which we propose to give the name of radium.
- There are sadistic scientists who hurry to hunt down errors instead of establishing the truth.
- This means that we have here an entirely separate kind of chemistry for which the current tool we use is the electrometer, not the balance, and which we might well call the chemistry of the imponderable.
- We believe the substance we have extracted from pitch-blende contains a metal not yet observed, related to bismuth by its analytical properties. If the existence of this new metal is confirmed we propose to call it polonium, from the name of the original country of one of us.

- We cannot hope to build a better world without improving the individual. Toward this end, each of us must work for his own highest development, accepting at the same time his share of responsibility in the general life of humanity—our particular duty being to aid those to whom we think we can be most useful.
- We must not forget that when radium was discovered no one knew that it would prove useful in hospitals. The work was one of pure science. And this is a proof that scientific work must not be considered from the point of view of the direct usefulness of it. It must be done for itself, for the beauty of science, and then there is always the chance that a scientific discovery may become like the radium a benefit for humanity.
- When one studies strongly radioactive substances special precautions must be taken if one wishes to be able to take delicate measurements. The various objects used in a chemical laboratory and those used in a physics laboratory, and those which serve for experiments in physics, become radioactive in a short time and act upon photographic plates through black paper. Dust, the air of the room, and one's clothes all become radioactive.

[Kindly visit these Web Links for MORE Quotes](#)

[01] <https://www.boredpanda.com/marie-curie-quotes/>

[02] https://www.goodreads.com/author/quotes/126903.Marie_Curie

[03] <https://www.mariecurie.org.uk/who>



TIMELINE

<https://www.exploros.com/summary/grade-8-timeline-of-marie-sklodowska-curie>

1867 Born in Warsaw, Poland.

1893-94 Earned math and physics degrees at the Sorbonne in Paris. Started writing a **doctoral thesis** on **radiation**. It had been discovered in 1896 by Antoine Henri Becquerel.

1895 Married physicist Pierre Curie, head of the laboratory at the School of Industrial Physics and Chemistry in Paris. Joined him in his work there.

1896-1903 Measured radiation levels emitted by various compounds. Discovered two substances that emitted more radiation than would be expected. In 1898, concluded that one of them contained an unknown radioactive element. Pierre Curie joined his wife in conducting research. Together, the pair discovered two new radioactive elements. They named the elements *polonium* (after Poland) and *radium*. Their work then focused on identify their chemical properties.

1897 Gave birth to her first daughter, Irene.

1903 Earned her doctorate, based on the work described in her thesis, *Radio-Active Substances*. With her husband and Becquerel, was awarded the Nobel Prize in Physics.

1904 Gave birth to her second daughter, Eve. Pierre Curie named a professor at the Sorbonne.

1906 After her husband was killed by a truck on a Paris street, assumed his position at the Sorbonne. Became the first female lecturer in the 750-year history of the university. Also assumed charge of the Sorbonne lab.

1908 Promoted to Professor at the Sorbonne.

1911 Awarded a second Nobel Prize for Chemistry, for isolating pure radium.

914-1918 During World War I, developed X-rays for use in medicine.

1918-1934 Became director of the scientific department of the Radium Institute. Joined by her daughter Irene Joliot-Curie and

husband Frederic Joliot. Continued to research the chemistry of radioactive materials and their medical applications. Lectured internationally. Established scholarships for scientists.

1934 Died of **leukemia**, likely due to prolonged exposure to radiation during her lifetime.

1935 Daughter Irene Joliot-Curie and Frederic Joliot received the Nobel Prize in Chemistry.

Joliot-Curie's daughter became a nuclear physicist and their son a biochemist, both making significant scientific contributions. Their grandson is an astrophysicist.

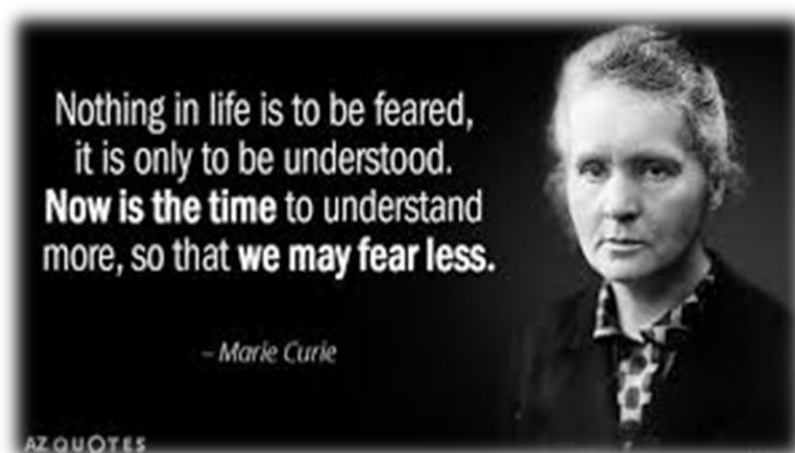
Kindly visit these Web Links for MORE information

01] <https://www.britannica.com/summary/Marie-Curie-Timeline>

02] https://softschools.com/timelines/marie_curie_timeline/78/

03] <https://www.sciencehistory.org/education/scientific-biographies/marie-sklodowska-curie/>

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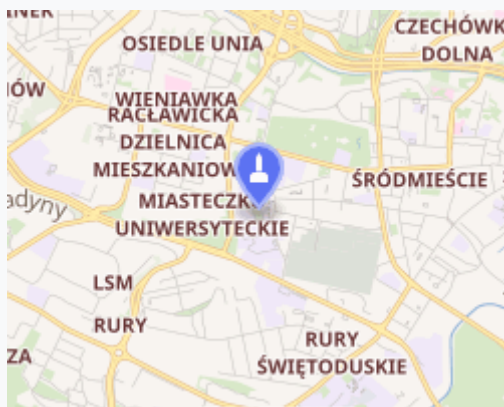


Monuments

Maria Skłodowska-Curie

[https://en.wikipedia.org/wiki/Maria_Sk%C5%82odowska-Curie_Monument_\(Lublin\)#](https://en.wikipedia.org/wiki/Maria_Sk%C5%82odowska-Curie_Monument_(Lublin)#)

Maria Skłodowska-Curie Monument



[Wikimedia](#) | © [OpenStreetMap](#)

 **51°14'44"N 22°32'30"E**

Location	Lublin , Poland
Designer	Marian Konieczny
Material	bronze
Height	4 meters (13.1 ft)
Opening date	24 October 1964
Dedicated to	Marie Curie

The **Maria Skłodowska-Curie Monument** (**Polish**: *Pomnik Marii Skłodowskiej-Curie w Lublinie*) is a **bronze** statue in **Lublin**, eastern Poland, dedicated to Polish physicist and chemist **Marie Curie** (1867-1934).

History

The bronze monument was designed by Polish sculptor **Marian Konieczny** (with Stanisław Ciecchan) and ceremonially unveiled on 24 October 1964. It is 9 metres high (including **pedestal**) and stands on Marie Skłodowska-Curie Square (*Plac Marii Skłodowskiej-Curie*), near **Maria Curie-Skłodowska University** (**UMCS**).

Marie Curie is depicted in a long robe and holding a book in her right hand. The pedestal inscriptions read: "To Maria Skłodowska-Curie, from the University Bearing Her Name, and from [Polish] Society" and "On the 20th Anniversary of the Founding of the University. 1944-1964."

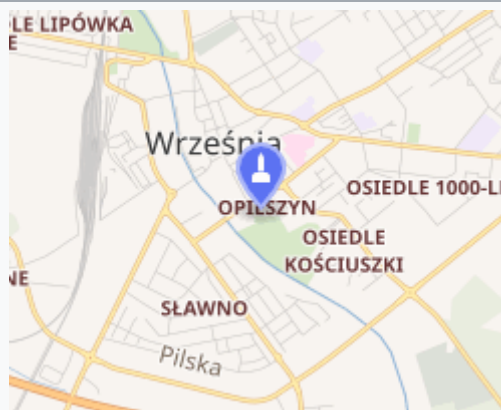
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[https://en.wikipedia.org/wiki/Maria_Konopnicka_Monument_\(Wrze%C5%9Bnia\)](https://en.wikipedia.org/wiki/Maria_Konopnicka_Monument_(Wrze%C5%9Bnia))

Maria Konopnicka Monument in Września



View of the Maria Konopnicka Monument in Września, 2012



[Wikimedia](#) | © [OpenStreetMap](#)



52°19'17"N 17°34'09"E

Location	Września, Poland
Designer	Mieczysław Welter
Material	bronze
Height	3.65 meters (11 ft)
Opening date	1979
Dedicated to	Maria Konopnicka

The **Maria Konopnicka Monument in Września** (**Polish**: *Pomnik Marii Konopnickiej we Wrześni*) is a **bronze** statue located in the town of **Września**, **Greater Poland Region**, and dedicated to **Maria Konopnicka** (1842–1910), a Polish **poet**, **novelist**, **children's writer** and activist for **women's rights** and for Polish independence.

History

The monument was designed by sculptor Mieczysław Welter and officially unveiled in 1979. The bronze cast of the statute was made in the Pomet Metallurgy Works in **Poznań** (*Zakłady Metalurgiczne "Pomet" w Poznaniu*). The location of the monument was chosen to pay tribute to the poet for her support and defence of the schoolchildren participating in the **Września School Strike** against the policy of **Germanization** in the years 1901–1904. The monument was erected on the initiative of and funded by the inhabitants of Września. It is currently situated in the Children of Września Park. Near the monument, eight bronze sculptures of books designed by Poznań-born sculptor and **medallist** Józef Stasiński, have been located.

[Kindly visit these Web Links to know MORE](#)

[01] [https://commons.wikimedia.org/wiki/Category:Monuments
and memorials to Marie Curie](https://commons.wikimedia.org/wiki/Category:Monuments_and_memorials_to_Marie_Curie)

[02] <https://www.findagrave.com/memorial/1613/marie-curie>

[03] [https://talkingstatues.com/statue/maria-sklodowska/
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